Diffusion Models for Medical Anomaly Detection

Abstract

In medical applications, weakly supervised anomaly detection methods are of great interest, as only image-level annotations are required for training. Current anomaly detection methods mainly rely on generative adversarial networks or autoencoder models. Those models are often complicated to train or have difficulties to preserve fine details in the image. We present a novel weakly supervised anomaly detection method based on denoising diffusion implicit models. We combine the deterministic iterative noising and denoising scheme with classifier guidance for image-to-image translation between diseased and healthy subjects. Our method generates very detailed anomaly maps without the need for a complex training procedure. We evaluate our method on the BRATS2020 dataset for brain tumor detection and the CheXpert dataset for detecting pleural effusions.